February 19, 2021

U.S. Department
of Transportation

**Pipeline and Hazardous
Materials Safety Administration**

East Building, PHH-30
1200 New Jersey Avenue S.E.
Washington, D.C. 20590

DOT-SP 12440
(TWELFTH REVISION)

EXPIRATION DATE: 2025-01-31

(FOR RENEWAL, SEE 49 CFR 107.109)

1. GRANTEE: Luxfer Inc.
Riverside, CA

2. PURPOSE AND LIMITATIONS:

a. This special permit authorizes the manufacture, mark, sale, and use of a non-DOT specification cylinder conforming to all regulations applicable to a DOT-3AL specification cylinder, except as specified herein, for the transportation in commerce of the hazardous materials authorized by this special permit. This special permit provides no relief from the Hazardous Materials Regulations (HMR) other than as specifically stated herein. The most recent revision supersedes all previous revisions.

b. The safety analyses performed in development of this Special Permit only considered the hazard and risks associated with transportation in commerce.

c. In accordance with 49 CFR 107.107(a), party status may not be granted to a manufacturing permit. These packagings may be used in accordance with 49 CFR 173.22a.

3. REGULATORY SYSTEM AFFECTED: 49 CFR Parts 106, 107 and 171-180.

4. REGULATIONS FROM WHICH EXEMPTED: 49 CFR §§ 173.301(a)(1), 173.302(a), and 173.304(a) and § 180.205(a) in that a non-DOT specification cylinder is not authorized, except as prescribed herein.

5. BASIS: This special permit is based on the application of Luxfer Inc. dated February 2, 2021 and submitted in accordance with § 107.109.

6. HAZARDOUS MATERIALS (49 CFR 172.101):

Hazardous Materials Description			
Proper Shipping Name	**Hazard Class/ Division**	**Identi-fication Number**	**Packing Group**
Air, compressed	2.2	UN1002	N/A
Argon, compressed	2.2	UN1006	N/A
Carbon dioxide, compressed	2.2	UN1013	N/A
Helium, compressed	2.2	UN1046	N/A
Krypton, compressed	2.2	UN1056	N/A
Neon, compressed	2.2	UN1065	N/A
Nitrogen, compressed	2.2	UN1066	N/A
Oxygen, compressed	2.2	UN1072	N/A
Xenon, compressed	2.2	UN2036	N/A

7. SAFETY CONTROL MEASURES:

a. PACKAGING: Packaging prescribed is a non-DOT specification aluminum cylinder manufactured in accordance with the Luxfer Gas Cylinders specification on file with the Office of Hazardous Materials Safety Approvals and Permits Division (OHMSAPD) and in conformance with §§ 178.35 and 178.46, except as follows:

§ 178.35(f) *Marking*. Applies, except using "DOT-SP 12440" in lieu of "DOT-3AL" followed by the service pressure.

§ 178.46(a) *Size and service pressure*. Packaging prescribed is a seamless aluminum cylinder having a:

- Maximum service pressure of 207 Bar (3,000 psig);
- Maximum water capacity of 6 liters;
- Maximum external diameter of 140 mm (5.5 inches);
- Maximum yield stress of 470 MPa (68.2 ksi);
- Maximum ultimate tensile strength of 525 MPa (76.2 ksi); and
- Minimum elongation of 12 percent.

§ 178.46(b) A*uthorized materials and identification of materials*

(1), (2), (3) * * *

(4) Only aluminum alloy 7032 as described in Luxfer Gas Cylinders specification on file with the OHMSAPD. The elemental compositions are limited to the following:

CHEMICAL COMPOSITION IN WEIGHT PERCENT

Alloy	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Pb	Bi	Other		Al
											Each	Total	
7032	0.07 Max	0.1 Max	1.7-2.3	0.05 Max	1.5-2.2	0.16-0.22	5.7-6.5	0.1 Max	0.005 Max	0.005 Max	0.05 Max	0.15 Max	Bal

§ 178.46 (c) *Manufacture*.

(1) * * *

(2), (3) Shape and thickness of the cylinder bottom and sidewall adjacent to the bottom must be such that failure during the cyclic pressure test occurs in the sidewall of the cylinder.

(4), (5), (6) * * *

(7) *Electrical Conductivity Test.* Each cylinder must be subjected to an electrical conductivity test to estimate the yield strength of the solution-heat treated, quenched and aged cylinder. At a minimum, two readings must be taken in the cylindrical section approximately three inches from the shoulder and bottom of each cylinder after the heat treatment. Measured electrical conductivity values should exceed 40.1% and be less than 42.9% of the International Annealed Copper Standard (IACS) at 20 °C, where by definition commercially pure copper is considered to be 100%. The electrical conductivity test procedure must be in accordance with MIL-STD-1537C and Luxfer Gas Cylinders test method on file with the OHMSAPD.

(8) *Fatigue Performance Test.* The design authorized herein must qualify the production lots by subjecting a prototype sample to pressure cycling tests as follows:

Lot (Batch) Number*	Cylinder Sample Rate
1-15	1 per lot
16-30	1 for every 2 lots
31-50	1 for every 5 lots
51-100	1 for every 10 lots
100-200	1 for every 20 lots
200+	1 for every 30 lots

* A "lot" is described in this Special Permit, paragraph 7.a. § 178.46(l).

(i) Cycle Test. The cycle test must be performed on a completed cylinder after hydrostatic (autofrettage) test by subjecting the cylinder to successive hydrostatic pressurizations from the lower cyclic pressure to the upper cyclic pressure at a rate not to exceed 10 cycles per minute. The cylinder must withstand at least 10,000

cyclic pressurizations without visual distortion, leaking or rupture at any point in the cylinder. All cycle tests must be performed using water with corrosion inhibitors as the pressurizing medium. Adequate recording instrumentation must be provided if equipment is to be left unattended for any period of time. Lower cyclic pressure must not exceed 10 percent of the upper cyclic pressure. Upper cyclic pressure must be at least equal to the minimum prescribed test pressure.

(ii) If a cylinder fails the cycling test described herein, the cylinder-sampling rate per lot will return to one level more demanding as described in the Fatigue Performance Test table above. If the first cylinder tested from a lot fails, two additional cylinders from the lot must be cycle tested. A lot will be rejected if either of the addition cylinders fails to survive 10,000 cycles.

(iii) The cylinder used for the fatigue performance test must not be used in service and the cylinder must be condemned.

§ 178.46(d) * * *

§ 178.46(e) * * *

§ 178.46(f) * * *

§ 178.46(g) *Hydrostatic test.*

(1) * * *

(2) Any internal pressure applied to the cylinder (autofrettage) before or during any official test may not exceed 130 percent of the cylinder's design test pressure.

(3), (4) * * *

§ 178.46(h) * * *

§ 178.46(i) * * *

§ 178.46(j) * * *

§ 178.46(k) *Duties of inspector.*

(1), (2), (3), (4) * * *

(5) The inspector shall verify that the lot qualification tests described in paragraph 7.a., § 178.46(c)(7) and (8) of this special permit have been performed with acceptable results.

§ 178.46(l) * * *

§ 178.46(m) Inspector's report.

* * *

(1) The inspector must also record all data and results of the testing described in paragraph 7.a., § 178.46(c)(7) and (8) of this special permit.

b. TESTING: Each cylinder must be requalified for use every five years in accordance with § 180.205 as prescribed for DOT Specification 3AL cylinders.

c. OPERATIONAL CONTROLS:

(1) A cylinder that has been subjected to fire may not be returned to service.

(2) Cylinders used in oxygen service must conform with § 173.302(a)(5)(i) through (iv).

(3) Transportation of oxygen by aircraft is only authorized when in accordance with § 175.501.

(4) Cylinders used in carbon dioxide service must conform with § 173.304a(a)(2) as prescribed for DOT 3AL cylinders. Maximum filling density must be 68% and the minimum marked service pressure must be 1,800 psig.

8. SPECIAL PROVISIONS:

a. Luxfer Inc. must retain the test reports for cylinders manufactured under this special permit for as long as these cylinders are authorized. Additionally, a copy of the

Inspector's report for the manufacturing of cylinders authorized under this special permit shall be reported to the OHMSAPD. The report shall include *Electrical Conductivity test* for each lot and cycling test data as described in paragraph 7.a. and § 178.46(c).

b. In accordance with the provisions of Paragraph (b) of § 173.22a, persons may use the packaging authorized by this special permit for the transportation of the hazardous materials specified in paragraph 6, only in conformance with the terms of this special permit.

c. A person who is not a holder of this special permit, but receives a package covered by this special permit, may reoffer it for transportation provided no modification or change is made to the package and it is offered for transportation in conformance with this special permit and the HMR.

d. A current copy of this special permit must be maintained at each facility where the package is offered or reoffered for transportation.

e. A current copy of this special permit must be maintained at each facility where the package is manufactured under this special permit and must be made available to a DOT representative upon request.

f. Each packaging manufactured under the authority of this special permit must be either (1) marked with the name of the manufacturer and location (city and state) of the facility at which it is manufactured or (2) marked with a registration symbol designated for a specific manufacturing facility by OHMSAPD for a specific manufacturing facility.

g. The cylinders described in this special permit are authorized only for normal transportation as an article of commerce i.e., the movement of hazardous materials packages from consignor to consignee.

9. MODES OF TRANSPORTATION AUTHORIZED: Motor vehicle, rail freight, cargo vessel and cargo-only aircraft. (See paragraphs 7.c.(3) for restrictions.)

10. MODAL REQUIREMENTS: A current copy of this special permit must be carried aboard each cargo vessel or aircraft used to transport packages covered by this special permit. The shipper must furnish a current copy of this special permit

to the air carrier before or at the time the shipment is tendered. Additionally, any modal-specific requirements applicable to DOT Specification 3AL cylinders apply to cylinders authorized under the terms of this special permit.

11. COMPLIANCE: Failure by a person to comply with any of the following may result in suspension or revocation of this special permit and penalties prescribed by the Federal hazardous materials transportation law, 49 U.S.C. 5101 et seq:

    - All terms and conditions prescribed in this special permit and the Hazardous Materials Regulations, 49 CFR Parts 171-180.
    - Persons operating under the terms of this special permit must comply with the security plan requirement in Subpart I of Part 172 of the HMR, when applicable.
    - Registration required by § 107.601 et seq., when applicable.

    Each "Hazmat employee", as defined in § 171.8, who performs a function subject to this special permit must receive training on the requirements and conditions of this special permit in addition to the training required by §§ 172.700 through 172.704.

    No person may use or apply this special permit, including display of its number, when this special permit has expired or is otherwise no longer in effect.

    Under Title VII of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) — "The Hazardous Materials Safety and Security Reauthorization Act of 2005" (Pub. L. 109-59), 119 Stat. 1144 (August 10, 2005), amended the Federal hazardous materials transportation law by changing the term "exemption" to "special permit" and authorizes a special permit to be granted up to two years for new special permits and up to four years for renewals.

12. REPORTING REQUIREMENTS: Shipments or operations conducted under this special permit are subject to the Hazardous Materials Incident Reporting requirements specified in 49 CFR §§ 171.15 Immediate notice of certain hazardous materials incidents, and 171.16 Detailed hazardous materials incident reports. In addition, the grantee(s) of this

special permit must notify the Associate Administrator for Hazardous Materials Safety, in writing, of any incident involving a package, shipment or operation conducted under terms of this special permit.

Issued in Washington, D.C.:

for William Schoonover
Associate Administrator for Hazardous Materials Safety

Address all inquiries to: Associate Administrator for Hazardous Materials Safety, Pipeline and Hazardous Materials Safety Administration, U.S. Department of Transportation, East Building PHH-30, 1200 New Jersey Avenue, Southeast, Washington, D.C. 20590.

Copies of this special permit may be obtained by accessing the Hazardous Materials Safety Homepage at http://hazmat.dot.gov/sp_app/special_permits/spec_perm_index.htm Photo reproductions and legible reductions of this special permit are permitted. Any alteration of this special permit is prohibited.

PO: ae